Language Processing outside the Realm of Consciousness

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The concept "Out of sight, out of mind" has been repeatedly challenged by findings that show visual information biases behavior even without reaching consciousness. However, the depth and complexity of unconscious processing remains elusive. To tackle this issue, we examined whether high-level linguistic information, including syntax and semantics, can be processed without consciousness.

Using binocular suppression, we showed that after a visible sentential context, a subsequent syntactically incongruent word broke suppression and reached consciousness earlier. Critically, when the sentential context was suppressed while participants made a lexical decision to the subsequent visible word, faster responses to syntactically incongruent words were obtained. Further control experiments show that (1) the effect could not be explained by simple word-word associations since the effect disappeared when the subliminal words were flipped and (2) the effect occurred independent of accurate localization of the subliminal text.

In another study we utilized a "double Stroop" paradigm where a suppressed colored word served as a prime while participants responded to a subsequent visible Stroop word. In the word-naming task, we showed that word but not color inconsistency slowed down the response time to the target, suggesting that semantic retrieval was prioritized. However, when asked to name the color, the same effect was obtained only after a significant practice effect on the color naming (i.e. reduction of response time) occurred, suggesting a competition of attentional resources between the current conscious task and unconscious stimulus. These findings were later replicated in separate experiments.

Across multiple studies we showed that high-level linguistic information can be processed unconsciously and exert an effect. These findings push the limit of unconscious processing and further show that an interplay between conscious and unconscious processing is crucial for such unconscious effect to occur.

The Feeling of Volition as a Retrospective Observational Inference

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We generally assume that intentions and decisions cause our voluntary acts: We form a conscious intention to do something, and then this mental act leads to a bodily act. Neuroscientific research into the timeline of volition faces the challenge of measuring and reconciling events along many unstably related timelines - external, neural and mental. We use motor TMS stimulation to create a reference event, allowing for single-trial temporal order judgements to be meaningful across all the timelines.

We use electromyography (EMG) to monitor the participant's (e.g.) thumb. 2) TMS is targeted to motor cortex so as to elicit an involuntary thumb movement. 3) The participant is asked to relax, and at a time of their own choosing, to flex their thumb (a voluntary movement). When the EMG detect the initiation of this movement, it triggers the TMS to activate.

In many cases, the participants report that the TMS click and its resulting thumb movement happened prior to their own volition. Some describe it as if the machine was reading their mind, and just as they were about to decide to act, the TMS beat them to it. The way we have set up the

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The 15th Asia-Pacific Conference on Vision (APCV), 2019

The 15th Asia-Pacific Conference on Vision was held in Osaka, JAPAN, from 29th of July to 1st of August, 2019. The conference aimed to facilitate discussion on vision research in Asian-Pacific region, attended by 458 participants from all over the world. The program consisted of four keynote lectures, 13 symposia including 57 speakers, and 50 oral and 220 poster presentations. The organizing committee are grateful to all the contributions.

The Abstracts are provided below. Keynote talks are presented first, symposia second, and then the contributed talks and posters are listed by session.

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